

Parasites Reared from Pupae

1. Hym.; Chalcididae: *Brachymeria* sp. (Howard, 1885, U.S. Dept. Agric., Bur. Entomol., Bull. No. 5, 47 pp.): *A. clyton* pupa (TEXAS: Gonzales Co., 15-X-77).
2. Hym.; Ichneumonidae: *Itopectis conquisitor* (Say): *A. clyton* pupa (TEXAS: Dimmit Co., 21-IV-79).

Predators

1. Hem.: Pentatomidae: *Apateticus cynicus* Say (Slater and Baranowski, 1978, How to know the true bugs (Hemiptera-Heteroptera), Wm. C. Brown Co. Publ., Dubuque, Iowa, 256 pp.): *A. clyton* early stage larvae (TEXAS: Travis Co., 26-III, 24-V, 18-X, 31-X-77).
2. Hem.: Pentatomidae: *Apateticus lineolatus* (Herrick-Schaeffer) (det. J. Eger): *A. clyton* larvae (TEXAS: Cameron Co., 13-III-79).
3. Hem.: Pentatomidae: *Podisus maculiventris* (Say) (Slater and Baranowski, 1978, loc. cit.): *A. clyton* early stage larvae (TEXAS: Travis Co., 24-V, 1-VI, 23-28-X-77, 23-V-78).
4. Hem.: Reduviidae: *Sinea* prob. *sanguisuga* Stal: *A. clyton* second stage larva (TEXAS: Travis Co., 29-V-78).
5. Hem.: Reduviidae: *Sinea spinipes* (Herrick-Schaeffer) (Slater and Baranowski, 1978, loc. cit.): *A. clyton* early stage larvae (TEXAS: Travis Co., 28-X-77).
6. Hym.: Vespidae: *Polistes exclamans* Viereck: *A. celtis* fifth stage larva (TEXAS: Travis Co., 24-IV-78); *A. clyton* third stage larvae (TEXAS: Travis Co., 25-X-77).
7. Hym.: Vespidae: *Vespa* sp.: *A. clyton* third stage larvae (TEXAS: Travis Co., 31-X-77).

TIMOTHY P. FRIEDLANDER, *Department of Entomology, Texas A&M University, College Station, Texas 77843.*

¹ None were reared from larvae. One female *Meteorus* was observed to oviposit in *A. clyton* larvae. One female hyperparasite of *Meteorus* was observed to oviposit in larvae of the same species. One of these hyperparasites was reared from *Meteorus* cocoons taken in close association with *A. clyton* larvae.

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ITHOMIINE BUTTERFLIES ASSOCIATED WITH NON-ANTBIRD DROPPINGS IN COSTA RICAN TROPICAL RAIN FOREST

Adult females of *Mechanitis* and the allied genus *Melinaea* (Brown, 1977, Syst. Entomol. 2:161-197) feed on the fresh droppings of birds (primarily antbirds) that follow swarms of army ants through tropical rain forest in Costa Rica (e.g., Ray and Andrews, 1980, Science 210:1147-1148). These authors conclude that bird droppings resulting from birds following army ant swarms provide a predictable nutrient resource for these female butterflies, and that the exploitation of this resource may be related, in some yet to be studied way, to egg production. In this note I extend the findings of Ray and Andrews (op. cit.) to the association of female ithomiines of various genera to fresh droppings of bird species not associated with army ant swarms in Costa Rican tropical rain forest. I conclude that fresh bird droppings of any kind in such a habitat provide a resource exploited by ithomiines on an opportunistic basis.

Between 1972 and 1980, I conducted several studies of various butterfly species in a small parcel of relatively undisturbed mixed primary and secondary-growth tropical rain forest (premontane tropical wet forest) at "Finca La Tigra", near La Virgen (220 m elev.), Heredia Province, Costa Rica. The site is about 20 km from the "Finca La Selva"



FIG. 1. Female *Godyris zavelata caesiopicta* feeding at fresh bird dropping at a light gap in the forest habitat at Finca La Tigra in northeastern Costa Rica.

study site of Ray and Andrews (op. cit.). During this lengthy period, I observed ithomiine butterflies feeding on fresh bird droppings splashed on leaves of understory plants, particularly along foot paths and light gaps in the forest. This was not a deliberate search for butterflies, but rather accidental encounters within an approximately 500-square meter area usually visited three or four months each year. *Mechanitis* spp. and *Hypothyris euclea leucania* (Bates) were the most frequently observed ithomiines exhibiting this behavior. These ithomiines are very abundant, relative to others, at this locality (Young, 1976, Pan Pacific Entomol. 53:104-113; Young, 1979, J. Lepid. Soc. 33:68-69; Young and Moffett, 1979a, Amer. Midl. Natur. 101:309-319; 1979b, Deutschen Ent. Zeitschr. 26:21-38). A less numerous ithomiine, *Godyris zavelata caesiopicta* (Niepelt) was also observed feeding on fresh bird droppings at various times in the same period (Fig. 1). In my experience, encounters of such behavior consisted of usually one or two butterflies, either both on the same dropping or on separate droppings in the case of two or more. Large aggregates of ithomiines on bird droppings were not encountered. At the same times, however, I did not notice any swarms of army ants in the same areas, or in adjacent open areas such as a cacao plantation forming the border to the forest study site. In one instance with *Godyris* (10 July 1982 at 1600 h) I noticed a single butterfly feeding at a dropping for close to forty minutes but with frequent interruptions by several flies (Diptera) that chased it away temporarily. *Godyris zavelata* females are easily distinguished from males by wing colors (Young, 1974, Entomol. News 85:227-238). It is by no means as abundant locally (in this area) as *Mechanitis* and *Hypothyris*. Several other bluish clear-wing ithomiines (undetermined) also visited fresh bird droppings in the same forest patch.

Based upon these preliminary observations made at irregular intervals over several years at the same forest patch in northeastern Costa Rica, I suggest that the females of several genera of ithomiine butterflies routinely exploit, on an opportunistic basis, fresh

bird droppings splashed on understory vegetation. Areas of tropical rain forest with disruptions in the canopy, such as light gaps and foot paths, are particularly attractive gathering places for various species of birds, perhaps because many insects, potential prey, and other arthropods are also found in these microhabitats. In turn, bird droppings occur there frequently, although perhaps in an unpredictable fashion, selecting for opportunistic foraging by female ithomiines. When large concentrations of bird droppings become available, such ithomiines, at least *Mechanitis* and *Melinaea*, may exhibit deliberate orientation to such food resources and become abundant there, as reported elsewhere (Ray and Andrews, op. cit.).

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ALLEN M. YOUNG, *Invertebrate Zoology Section, Milwaukee Public Museum, Milwaukee, Wisconsin 53233.*

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SATYRIUM KINGI (LYCAENIDAE) TAKEN IN MARYLAND

At 1600 h on 22 July 1982, after spending a discouraging time collecting in three areas in Wicomico and Worcester Counties in Maryland, I caught a *Satyrium kingi* (Klots and Clench) near Millville, Worcester County. This capture represents a significant northward extension of the known range of this species on the coastal plain.

The orange cap on the blue spot on the hindwing ventrum showed the identity of this rare find. Its abdomen was thin, and its long tails were gone, but the slight roundness of its wings and the fact that it landed on a sweetgum sapling at about 5-6 feet above the ground corresponded with the description of Gatrell (1974, *J. Lepid. Soc.* 28:33-37) of the flight habits of females. Its flight was slow, due possibly to its age, the lateness of the hour, or the deep shade in the area, but it does agree with the "sluggish" adjective used by Covell and Straley (1973, *J. Lepid. Soc.* 27:144-154). The very late date and the condition of the specimen (Fig. 1) indicated that this was possibly the last survivor of the season's brood.



FIG. 1. **Left:** *S. kingi*, male. Suffolk, Nansemond County, Virginia, July 1, 1974, lower aspect; **Right:** *S. kingi*, female, Millville, Worcester County, Maryland, July 22, 1982, lower aspect.